

CLAIMS

What is claimed is:

1. An apparatus for supplying power to a set of servers or computer
5 systems, the apparatus comprising:
at least one power supplying bus bar to which power inputs of the
computer systems is connected;
a plurality of power supplies;
a plurality of power switches for selectively connecting the power supplies
10 to said at least one bus bar; and
a power supply management controller configured to control the power
switches such that the power is supplied redundantly to the
computer systems.
- 15 2. The apparatus of claim 1 comprising at least two bus bars such that
further redundancy is provided.
3. The apparatus of claim 1, further comprising:
an expander device for coupling the power supply management controller
20 to control inputs of the power switches.
4. The apparatus of claim 1, wherein each power supply includes a power
sensor that measures at least voltage and current of power supplied, and
wherein the power supply management controller is further configured to
25 receive status information from the power supplies.
5. The apparatus of claim 4, wherein the status information is retrieved by
way of a polling type mechanism.
- 30 6. The apparatus of claim 4, wherein the status information is received by
way of an interrupt type mechanism.
7. The apparatus of claim 4, further comprising:

a serial bus multiplexer for multiplexing signals from the plurality of power supplies into a serial signal to the power supply management controller.

5 8. The apparatus of claim 1, wherein the plurality of power supplies each supply power at a same voltage level.

9. The apparatus of claim 8, wherein the plurality of power supplies are of non-uniform power capacities (wattage).

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10. The apparatus of claim 8, further comprising:
a rack onto which the computer systems are mounted,
wherein the plurality of bus bars are integrated into the rack.

15 11. The apparatus of claim 1, further comprising:
a consolidated cooling system for cooling the plurality of power supplies.

12. The apparatus of claim 1, wherein the power supplies have built-in cooling systems.

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13. The apparatus of claim 1, wherein the switches comprise field effect transistors of sufficiently high speed to avoid detrimental gaps in power supplied.

25 14. The apparatus of claim 1, wherein the switches comprise controllable electromagnetic relays.

15. The apparatus of claim 1, wherein the switches comprise controllable circuit breakers.

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16. The apparatus of claim 1, further comprising:
a communications channel between the computer systems and the power supply management controller for communicating power usage

information from the computer systems to the power supply management controller.

- 5 17. The apparatus of claim 1, wherein a bus bar is coupled via the switches to at least two power supplies.
18. The apparatus of claim 2, wherein a computer system is connected to the at least two bus bars.
- 10 19. The apparatus of claim 2, wherein a power supply is coupled via the switches to at least two bus bars.
20. A method for supplying redundant power to a plurality of computer systems coupled to a plurality of bus bars, the method comprising:
15 receiving status data from a plurality of power supplies;
determining a need to re-allocate the power supplies to the bus bars if the status data indicates a detrimental condition of a power supply; and
switching at least one power supply to supply power via one of the bus bars if the re-allocation is determined to be needed.
- 20 21. The method of claim 20, wherein the status data is requested periodically by way of polling.
22. The method of claim 21, wherein the polling comprises round robin type
25 scheduling.
23. The method of claim 20, wherein the status data is received by way of interrupts.
- 30 24. The method of claim 20, further comprising:
applying predictive failure analysis to the status data to predict an upcoming failure of a power supply.

25. The method of claim 24, further comprising:
evaluating an anticipated need to re-allocate the power supplies to the
bus bars in event of the upcoming failure; and
preemptively switching at least one power supply to supply power via one
5 of the bus bars if the re-allocation is anticipated to be needed.

26. The method of claim 20, further comprising:
receiving additional status data relating to power consumption from the
plurality of computer systems.

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27. The method of claim 20, wherein said determining takes into account
prioritization factors.

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28. A system for supplying redundant power to a plurality of computer
systems coupled to a plurality of bus bars, the system comprising:
means for receiving status data from a plurality of power supplies;
means for determining a need to re-allocate the power supplies to the bus
bars if the status data indicates a failure condition of a power
supply; and
20 means for switching at least one power supply to supply power via one of
the bus bars if the re-allocation is determined to be needed.